

## Stone Carbon Calculator FAQ's

### 2) Embodied carbon and the need for the calculator

What is embodied carbon and why does it matter?

Embodied carbon is a measure of the greenhouse gas (GHG) emissions associated with a material or product. The scope can vary, but in this case it includes the emissions associated with the extraction, processing, and transport of stone as far as the point of use (i.e. to the construction site).

GHG emissions around the world (primarily carbon dioxide) are causing climate change, and construction project teams are looking for ways to reduce the emissions associated with projects. With much progress made on 'operational carbon' (e.g. GHG emissions associated with heating and powering buildings), embodied carbon represents an increasingly significant proportion of the remaining problem, which has led to numerous voluntary initiatives and is now attracting the attention of regulators.

Why has this calculator been developed?

The calculator has been developed to support the specification of stone with lower embodied carbon. Environmental data on stone products used in Scotland is still quite rare, but more information on embodied carbon is being requested by clients as a result of voluntary initiatives to reduce embodied carbon in construction. Such initiatives may yet translate into regulations, as this is already happening in some European countries.

What does this calculator measure (and how)?

The calculator asks where rock is quarried, where it is sawn into construction products, where it is used, and how it is transported between these locations. Together with data concerning fuel use per km in the various transport modes, it uses this information to estimate the greenhouse gas emissions associated with each step, and therefore the overall embodied carbon.

How is it different to other carbon databases?

This calculator builds on existing data sources, but addresses a significant gap. Where such data sources cover transport, the information is to some extent generic as the exact location of the demand for the stone is unknown to the data providers. As transport tends to be a significant element of the embodied carbon of stone (especially when imported), a more accurate assessment can be achieved if specific data is used to cover transport all the way to the point of use.

### 2) Use and Interpretation of Results

How do I use the information?

The calculator supports direct comparisons of the embodied carbon of a given stone type from different suppliers, with a view to specifying stone with lower embodied carbon.

Comparisons may be made in other context, but care is needed to ensure that 'functional equivalence' is taken into account: for instance, the quantities of material specified should be whatever is needed to fulfil the same function over the same period of time.

How accurate is the calculator?

When the 'detailed' option is used, the calculator makes appropriate use of the available data. That said, the data is derived from various life cycle assessments (LCAs) and other studies carried out at

different times, in different locations, and potentially with different system boundaries: this is a general drawback with LCAs.

Because of the small number of studies available, the uncertainty associated with the assessment of the extraction and processing stages is assumed to be quite high, whilst the uncertainty associated with transport is lower if the supply chain is well understood.

Why does the calculator offer two different methods (simplified / detailed) ?

The simplified calculator has been provided as an option to allow a very quick initial estimate of the embodied carbon when information is limited – essentially to give an idea of how the origin of the stone influences the figure. When sharing embodied carbon information, or when making decisions based on such information, the detailed calculator should be used.

What if I already have an Environmental Product Declaration for the product in question?

If the EPD relates to the exact product specified (with the same supply chain), then the EPD's embodied carbon data for the product stage (A1-A3 on the EPD) should take precedence. But the calculator can still be used to assess the transport to the construction site or point of use (A4).

### 3) Practicalities

Who can use it?

The Stone Carbon Calculator has been designed to be simple and easy-to-use. It is intended for local authorities, designers, specifiers, procurement professionals, the construction industry, heritage sector and anyone else with an interest.

Is there any guidance on how to use the calculator?

The calculator has been designed to be simple to use. If you need help, a short guide, with step-by-step instructions is available. [Download a copy from our Stone Carbon Calculator webpage.](#)

Is there a calculator for other stone types?

Not yet. Depending on feedback from the pilot phase, the calculator may be improved and/or extended, and may include additional stone types, such as slate.

How will the calculator be kept up-to-date?

The first step is to move on from pilot to final version, following feedback. This will include reviewing where and how the calculator is hosted. Subsequently, emission factors for transportation modes will be reviewed and updated regularly, and further data on quarrying and manufacturing will be assessed and incorporated as appropriate.

Where can I find out more?

You can download copies of the two reports for this project *Embodied Carbon of Natural Stone in Scotland: A Methodology* and *ADDENDUM – Embodied Carbon of Granite* from [our Stone Carbon Calculator webpage](#). These documents explain how the calculator was developed.

If you still have questions, get in touch at [technicaleducation@hes.scot](mailto:technicaleducation@hes.scot)